



09/198,534

Docket No.: 48864-014

#26  
PATENT 6-17-04

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of	:	Customer Number: 20277
Shinichi BAN, et al.	:	Confirmation Number: 2638
Serial No.: 09/198,534	:	Group Art Unit: 2623
Filed: November 24, 1998	:	Examiner: BALI, Vikkram

For: DATA PROCESSING APPARATUS FOR PROCESSING A 3-DIMENSIONAL DATA  
OF AN OBJECT AND A METHOD THEREFOR

**SUBSTITUTE APPEAL BRIEF**

Mail Stop Appeal Brief  
Honorable Commissioner for Patents  
P.O. Box 1450  
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Sir:

This Appeal Brief is submitted in support of the Notice of Appeal of the final rejection of  
claims 1-25, 29-31, 34, 35 and 37-39, filed October 7, 2003.

**I. REAL PARTY IN INTEREST**

The real party in interest is MINOLTA CO. LTD. (operating as KONICA MINOLTA  
HOLDINGS, INC. as of October 1, 2003).

**II. RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related appeals and interferences.

**III. STATUS OF CLAIMS**

Claims 1-31 and 34-39 are pending in this application, of which claims 26-28 and 36 stand allowable. Claims 1-25, 29-31, 34, 35 and 37-39 have been finally rejected. It is from the final rejection of claims 1-25, 29-31, 34, 35 and 37-39 that this Appeal has been taken.

**IV. STATUS OF AMENDMENTS**

No amendment has been filed subsequent to the issuance of the Final Office Action dated April 7, 2003.

**V. SUMMARY OF THE INVENTION**

The present invention relates to a data processing apparatus for processing a 3-dimensional data for producing a model of an existing object and a method therefore. The apparatus and method is applied, for example, to production of a head model of a human being. When face elements are measured using a non-contact type 3-dimensional measuring apparatus, an element that is not discriminated from others in form viewpoints is not reproduced on the model. For example, when a face model of a human being is produced, of the form models obtained by 3-dimensional measuring, such face elements as the eyes, irises, lips and nose need modifying processing. In addition, irrespective of whether a non-contact type or contact type 3-dimensional measuring apparatus is use, it is difficult to measure hair accurately. In particular,

there is a problem that hair texture of the hair portion of the face model cannot be obtained and/or the hair portion is reproduced incompletely or is not reproduced.

The present invention addresses and solves these problems and comprises a modifying unit (40; Fig. 4; page 11, lines 21-23) for modifying at least a part of 3-dimensional form data (DS from 34; Fig. 4) with reference to 2-dimensional image data obtained by photographing an object. The modifying unit (40; Fig. 4; page 14, line 7 through page 15, line 9) extracts a specified area from the 2-dimensional image data (G2; Fig. 6) according to a setting condition (page 11, line 9) and modifies a part of the 3-dimensional form data corresponding to the specified area (G3; Fig. 6; page 15, lines 10-17. According to the modified 3-dimensional form data (step #20; Fig. 8; page 17, line 29 through page 21, line 23), a model is produced (steps #28, 30; Fig. 8; page 17, lines 21-24). As the object for photographing, for example, a human head is used. In this case, the specified area corresponds to at least one of the hair, forehead, eyebrows, eyes, irises, and lips.

## **VI. ISSUE**

### **A. The Rejections**

Claims 1-8 and 10-25, 29-31, 34, 35 and 37-39 stand rejected under 35 U.S.C. § 103 for obviousness predicated upon Munetsugu [et al.] (USPN 6,141,431, filed February 1, 1996 and issued on October 31, 2000).

Claim 9 stands rejected under 35 U.S.C. § 103 for obviousness predicated upon Munetsugu [et al.] in view of Appellants' Admitted Prior Art (AAPA).

**B. Issues**

The Issues which arise(s) in this Appeal and requires resolution by the Honorable Board of Patent Appeals and Interferences (Board) are:

(i) whether claims 1-8 and 10-25, 29-31, 34, 35 and 37-39 are unpatentable under 35 U.S.C. § 103 for obviousness predicated upon Munetsugu [et al.]; and

(ii) whether claim 9 is unpatentable under 35 U.S.C. § 103 for obviousness predicated upon Munetsugu [et al.] in view of Appellants' Admitted Prior Art (AAPA).

**VII. GROUPING OF CLAIMS**

Appellant separately argues the patentability of claims 1, 2, 3, 6, 9, 11 and 12, claims 4 and 5 stand or fall together depending upon the patentability of claim 3, claims 7 and 8 stand or fall together depending upon the patentability of claim 6, claims 10 and 13 stand or fall together depending upon the patentability of claim 1.

The Examiner considers claims 14-20 as claiming similar subject matter as claims 2, 3, 5, 6, 8, 11 and 12, respectively, claims 21-25 as claiming similar subject matter as one of the combination of claims 1-13, claims 29-31 as claiming similar subject matter as one of the combination of claims 1-13, claims 34 and 35 as claims similar subject matter as one of the combination of claims 1-13, and claims 37-39 as claiming similar subject matter as one of the combination of claims 1-13. Thus, claims 14-20 stand or fall together depending upon the patentability of claims 2, 3, 5, 6, 8, 11 and 12 respectively, claims 21-25 stand or fall depending

upon the patentability of the corresponding one of the combination of claims 1-13, claims 29-31 stand or fall depending upon the patentability of the corresponding one of the combination of claims 1-13, claims 34 and 35 stand or fall depending upon the patentability of the corresponding one of the combination of claims 1-13, and claims 37-39 stand or fall depending upon the patentability of the corresponding one of the combination of claims 1-13.

#### **VIII. THE ARGUMENT**

(i) Regarding the rejection of claims 1-8 and 10-25, 29-31, 34, 35 and 37-39 under 35 U.S.C. § 103(a) as being unpatentable over Munetsugu [et al.], the Examiner asserts that Munetsugu [et al.] discloses an image processing apparatus comprising [a] modifying unit which modifies a form of a part of the input data with maintaining a form of other part thereof based on 2-dimensional image data of the object, referring to column 3, lines 35-38. The Examiner then admits that Munetsugu [et al.] does “not explicitly disclose “3-dimensional form data and 2-dimensional image data”, as recited in claim 1. But, it is well known that the model of the face is 3-dimensional and image of the face is in 2-dimensions.”

Claim 1 recites:

A data processing apparatus for processing inputted 3-dimensional form data of an object, said data processing apparatus comprising:

a modifying unit which modifies a form of a part of the inputted 3-dimensional form data with maintaining a form of other parts thereof based on 2-dimensional image data of the object.

Even if it were presumed that it is well known that the model of the face is 3-dimensional and image of the face is in 2-dimensions, the Examiner has not established that Munetsugu [et

al.] discloses a modifying unit which modifies a form of a part of the *inputted 3-dimensional form data* with maintaining a form of other parts. Column 3, lines 35-38 merely describe:

The image processing apparatus may further comprise a face surface model generating part for generating the face surface model on the basis of the front face image.

Using the Examiner's interpretation, this portion describes that a face surface model (3-dimensional) is generated on the basis of the front face image (in 2-dimensions), not that there is *inputted 3-dimensional form data*, and that a part of this *inputted 3-dimensional form data* is modified.

Column 6, lines 19-23 of Munetsugu [et al.] describes:

This face surface model 14 is generated by recognizing the face in the front face image 13 in FIG. 3. That is, it is generated by recognizing the face in the front face image 13, and moving the vertices of the prepared standard wire frame model according to the recognized face.

Therefore, the face surface model 14 differs in the shape of the frame depending on the individual person, but is same in topology. In the process to generate the face surface model 14, the prior art disclosed in Japanese Laid-open Patents No. 5-197793, No. 4-199474 and others may be employed. Japanese Laid-open Patent Nos. 5-197793 and 199474 are incorporated herein by reference.

Thus, the face surface model 14 is generated by manipulating a standard wire frame model using the front face image. There is nothing about a face surface model being generated using *inputted 3-dimensional form data*.

Furthermore, in Munetsugu [et al.], a size of a hair image is merely adjusted to a size of a face information model. In other words, the face information model, as 3-dimensional form data, is *entirely* enlarged and *entirely* reduced. Munetsugu [et al.] does not disclose or suggest

modifying “...a form of *a part of the inputted 3-dimensional form data* with maintaining a form of other parts thereof.”

Claim 2 requires, *inter alia*:

a second generating unit which generates the 3-dimensional form data of the object independent of the 2-dimensional image data generated by the first generating unit; and

means for inputting the 2-dimensional image data and the 3-dimensional form data of the object to the data processing apparatus.

An example of the arrangement recited in claim 2 is shown, for example, in Fig. 4 of the present application.. The Examiner, at page 3 (with respect to independent claim 1), admits that Munetsugu [et al.] “did not explicitly disclose 3-dimensional form data and 2-dimensional image data.” Given such admission, it is clear that Munetsugu [et al.] does not disclose “a means for inputting ... the 3-dimensional form data of the object to the data processing apparatus”.

Claim 3 recites:

said modifying unit extracts an area from the 2-dimensional image data based on a predetermined condition, and modifies the form of the part of the 3-dimensional form data corresponding to the area.

The Examiner refers to column 5, lines 29-30 of Munetsugu [et al.] as disclosing the features recited in claim 3. However, column 5, lines 29-38 describe that a hair removed image 16 is generated by specifying removal region 15 from a front face image 23 (2-dimensional image) and modifying the front face image 13 (2-dimensional image). There is no disclosure or suggestion of modification *of 3-dimensional data* in this description of Munetsugu [et al.]. More

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specifically, the identified description merely explains that a face surface model 14 is used in order to determine the removal region 15.

Claim 6 recites:

said modifying unit extracts a first area from the 2-dimensional image data based on a first predetermined condition and a second area from the 3-dimensional form data based on a second predetermined condition, and

said modifying unit modifies the form of the part of the 3-dimensional form data corresponding to the first area and the form of the part of the 3-dimensional form data corresponding to the second area.

While the Examiner rejects claims 6-8 “as claims 3-5 as 6-8 are claiming similar subject matter as claims 3-5”, none of either claims 3, 4 or 5 recites that *a modifying unit extracts* a first area from the 2-dimensional image data based on a first predetermined condition and *a second area from the 3-dimensional form data based on a second predetermined condition, and the modifying unit modifies* the form of the part of the 3-dimensional form data corresponding to the first area and *the form of the part of the 3-dimensional form data corresponding to the second area.*

Claim 11 recites:

said modifying unit modifies the form of the part of the 3-dimensional form data to emphasize a portion of the object corresponding to the part.

As described above, Munetsugu [et al.] discloses that 3-dimensional form data are modified only in the description of Fig. 13 and all other parts of the reference disclose that 2-dimensional image is modified. According to the description of Fig. 13, a size of a face



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information model is changed in order to adjust a size of a hair image to the size of the face information model. Munetsugu [et al.] does not disclose modifying “...a form of a part of the inputted 3-dimensional form data with maintaining a form of other parts thereof”, let alone modifying “...the form of the part of the 3-dimensional form data to emphasize a portion of the object corresponding to the part.”

Claim 12 recites

said modifying unit modifies the form of the part of the 3-dimensional form data to smooth a portion of the object corresponding to the part.

The Examiner admits that Munetsugu [et al.] fails to disclose “smooth a partial form”, but contends that “it is obvious to smooth[ing] the images during the image processing for blurring and for noise reduction, the blurring is used in preprocessing steps such as removal of small details from an image”.

While the Examiner contends that the “*distinction*” between claim 12 and Munetsugu [et al.] is obvious, such contention lacks substantial evidence support. More specifically, no evidence has been provided on the record showing that such “*distinction*” is obvious or that it would have been obvious to one of ordinary skill in the art to modify Munetsugu [et al.]’s image processing system ... by introducing the known feature of “smoothing the images during the image processing for blurring and for noise reduction, the blurring is used in preprocessing steps such as removal of small details from an image”. The mere contention by the Examiner that “smoothing of the images

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during the image processing for blurring and for noise reduction, the blurring is used in preprocessing steps such as removal of small details from an image” is not objective evidence.

Reliance upon only statements by the Examiner as to what is “well known” in the art to reject claims is merely the opinion of the Examiner and not objective evidence that a claim, as a whole, is obvious within the meaning of 35 U.S.C. § 103. See *In re Zurko*, 258 F.3d 1379, 59 USPQ2d 1693 (Fed. Cir. 2001) and *In re Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). These decisions clearly support the position that a rejection of a claim(s) under 35 U.S.C. § 103 requires objective evidence of record, not just the opinion (of the Examiner).

### **Conclusion**

It should, therefore, be apparent that the Examiner did not establish a *prima facie* basis to deny patentability to the claimed invention for want of the requisite factual basis. Appellants, therefore, submit that the imposed rejection of claims 1-8 and 10-25, 29-31, 34, 35 and 37-39 under 35 U.S.C. § 103 as being unpatentable over Munetsugu [et al.] should not be sustained as the Examiner has not established a *prima facie* case of obviousness.

(ii) Regarding the rejection of claim 9 as being unpatentable under 35 U.S.C. § 103 for obviousness predicated upon Munetsugu [et al.] in view of Appellants’ Admitted Prior Art (AAPA) at page 17 of the present application, claim 9 recites:

...for extracting the first area, *area division* is carried out for a shade portion of the object by referring to the 2-dimensional image data of a surrounding portion.

At page 17 of the present application, Appellants describe that “a known graphic technique such as providing with a shade is used to make a good show”. However, this description does affect the patentability in claim 9.

More specifically, what is described at page 17 of the present application is a display of a 3-dimensional form model, and the description has no relation to *area division* from a 2-dimensional image, as recited in claim 9. In other words, the description at page 17 of the present specification that “a known graphic technique such as providing with a shade is used to make a good show” has nothing to do with the recitation that *area division* is carried out with respect to a shade portion of an object. Accordingly, AAPA at page 17 does not teach nor suggest that for extracting the first area, *area division* is carried out for a shade portion of the object, let alone that such *area division* is carried out for a shade portion of the object *by referring to the 2-dimensional image data of a surrounding portion*.

### **Conclusion**

Based upon the foregoing, Appellants, therefore, submit that the imposed rejection of claim 9 under 35 U.S.C. § 103 as being unpatentable over Munetsugu [et al.] in view of Appellants’ Admitted Prior Art (AAPA) should not be sustained as the Examiner has not established a *prima facie* case of obviousness.

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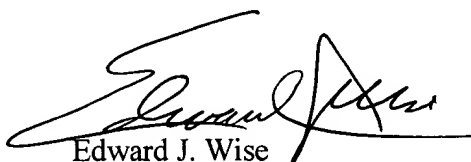
**IX. PRAYER FOR RELIEF**

Based upon the above arguments, Appellants, therefore, respectfully solicit the Honorable Board to reverse the Examiner's rejection of claims 1-8 and 10-25, 29-31, 34, 35 and 37-39 under 35 U.S.C. § 103 for obviousness predicated upon Munetsugu [et al.] and the rejection of claim 9 under 35 U.S.C. § 103 for obviousness predicated upon Munetsugu [et al.] in view of AAPA.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account and please credit any excess fees to such deposit account.

Respectfully submitted,

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**APPENDIX**

1. (Appealed) A data processing apparatus for processing inputted 3-dimensional form data of an object, said data processing apparatus comprising:

a modifying unit which modifies a form of a part of the inputted 3-dimensional form data with maintaining a form of other parts thereof based on 2-dimensional image data of the object.

2. (Appealed) The data processing apparatus of claim 1, further comprising:

a first generating unit which generates the 2-dimensional image data of the object;

a second generating unit which generates the 3-dimensional form data of the object independent of the 2-dimensional image data generated by the first generating unit; and

means for inputting the 2-dimensional image data and the 3-dimensional form data of the object to the data processing apparatus.

3. (Appealed) The data processing apparatus of claim 1, wherein said modifying unit extracts an area from the 2-dimensional image data based on a predetermined condition, and modifies the form of the part of the 3-dimensional form data corresponding to the area.

4. (Appealed) The data processing apparatus of claim 3, wherein the object is a head of a human.

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5. (Appealed) The data processing apparatus of claim 4, wherein the area corresponds to at least one of hair, a forehead, eyebrows, eyes, irises of eyes, and lips of the human.

6. (Appealed) The data processing apparatus of claim 1 wherein  
said modifying unit extracts a first area from the 2-dimensional image data based on a first predetermined condition and a second area from the 3-dimensional form data based on a second predetermined condition, and

said modifying unit modifies the form of the part of the 3-dimensional form data corresponding to the first area and the form of the part of the 3-dimensional form data corresponding to the second area.

7. (Appealed) The data processing apparatus of claim 6, wherein the object is a head of a human.

8. (Appealed) The data processing apparatus of claim 7, wherein the first area corresponds to at least one of eyebrows, eyes, irises of eyes, and lips of the human, and the second area corresponds to at least one of a nose and a neck of the human.

9. (Appealed) The data processing apparatus of claim 6, wherein for extracting the first area, area division is carried out for a shade portion of the object by referring to the 2-dimensional image data of a surrounding portion.

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10. (Appealed) The data processing apparatus of claim 1, wherein the object is a head of a human, and the part corresponds to at least one of hair, a forehead, eyes, irises of eyes, a nose, cheeks, lips, and a neck of the human.

11. (Appealed) The data processing apparatus of claim 10, wherein said modifying unit modifies the form of the part of the 3-dimensional form data to emphasize a portion of the object corresponding to the part.

12. (Appealed) The data processing apparatus of claim 10, wherein said modifying unit modifies the form of the part of the 3-dimensional form data to smooth a portion of the object corresponding to the part.

13. (Appealed) The data processing apparatus of claim 1, wherein said modifying unit modifies the form of the part of the 3-dimensional form data in the case where the data processing apparatus is set in a specific mode.

14. (Appealed) A method for processing 3-dimensional form data of an object, said method comprising the steps of:

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(a) inputting 2-dimensional image data of the object and the 3-dimensional form data of the object, the 3-dimensional form data and the 2-dimensional image data being independent of each other; and

(b) modifying a form of a part of the 3-dimensional form data with maintaining a form of other parts thereof based on 2-dimensional image data of the object.

15. (Appealed) The method of claim 14, the steps (b) comprising the steps of:

(b-1) extracting an area from the 2-dimensional image data based on a predetermined condition; and

(b-2) modifying the part of the 3-dimensional form data corresponding to the area.

16. (Appealed) The method of claim 15, wherein the area corresponds to at least one of hair, a forehead, eyebrows, eyes, irises of eyes, and lips of a human as the object.

17. (Appealed) The method of claim 14, wherein the step (b) comprising the steps of:

(b-1) extracting a first area from the 2-dimensional image data based on a first predetermined condition;

(b-2) extracting a second area from the 3-dimensional form data based on a second predetermined condition; and

(b-3) modifying parts of the 3-dimensional form data corresponding to the first and second areas.



18. (Appealed) The method of claim 17, wherein the first area corresponds to at least one of eyebrows, eyes, irises of eyes, and lips of a human as the object, and the second area corresponds to at least one of a nose and a neck of the human.

19. (Appealed) The method of claim 14, wherein a partial form of the object corresponding to the part is emphasized in the step (b).

20. (Appealed) The method of claim 14, wherein a partial form of the object corresponding to the part is smoothed in the step (b).

21. (Appealed) A data processing apparatus for processing 3-dimensional form data of a human head, said data processing apparatus comprising a modifying unit which modifies a part of the 3-dimensional form data into data representing hair, the part satisfying a predetermined condition.

22. (Appealed) The data processing apparatus of claim 21, wherein said modifying unit extracts an area of 2-dimensional image data of the human head satisfying the predetermined condition, and modifies the part of the 3-dimensional form data corresponding to the area.

23. (Appealed) The data processing apparatus of claim 22, further comprising:

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a first generating unit which generates the 2-dimensional image data of the human head;  
and  
a second generating unit which generates the 3-dimensional form data.

24. (Appealed) A method for processing 3-dimensional form data of a human head, said method comprising the steps of:

(a) inputting the 3-dimensional form data; and  
(b) modifying a part of the 3-dimensional form data into data representing hair, the part satisfying a predetermined condition.

25. (Appealed) The method of claim 24, said step (b) comprising the steps of:

(b-1) extracting an area of 2-dimensional image data of the human head satisfying the predetermined condition; and  
(b-2) modifying the part of the 3-dimensional form data corresponding to the area.

26. (Allowed) A 3-dimensional data processing apparatus for carrying out data processing with respect to a specified portion in a 3-dimensional form model of an object, said data processing apparatus comprising:

an obtaining portion for obtaining a distance image expressing distance information of the object by intensity; and

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a processing portion for dividing the obtained distance image into segments, determining if each of the segments corresponds to the specified portion in accordance with spatial frequency of the distance image within each of the divided segment and carrying out predetermined data processing with respect to each of the segments determined to correspond to the specified portion.

27. (Allowed) The 3-dimensional data processing apparatus of claim 26, further comprising:

a measuring portion for measuring a 3-dimensional form of the object to generate 3-dimensional form data of the object, wherein

said obtaining portion obtains a distance image by generating the distance image based on the measured 3-dimensional form data.

28. (Allowed) The data processing apparatus of claim 26, wherein said controller further executes the step of:

(c) modifying a part of the 3-dimensional form data corresponding to the area.

29. (Appealed) A method for processing 3-dimensional form data of an object, said method comprising the steps of:

(a) dividing 2-dimensional image data corresponding to the 3-dimensional form data into a plurality of sections; and

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(b) designating an area based on each of spatial frequency distributions of the sections.

30. (Appealed) The method of claim 29, further comprising the step of:

(c) generating the 2-dimensional image data based on the 3-dimensional data, wherein the step (b) is executed before the step (a).

31. (Appealed) The method of claim 29, further comprising the step of:

(c) modifying a part of the 3-dimensional form data corresponding to the area.

32-33 (Cancelled)

34. (Appealed) A method for processing 3-dimensional form data of an object, said method comprising:

(a) generating 3-dimensional form data of the object;

(b) generating 2-dimensional image data of the object, the 3-dimensional form data and 2-dimensional form data being generated independent of each other;  
and

(c) combining the 3-dimensional form data and the 2-dimensional image data to modify a form of a part of the 3-dimensional form data.

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35. (Appealed) The method of claim 34, further comprising the steps of

(c) inputting the 3-dimensional form data; and

(d) inputting the 2-dimensional image data,

wherein the step (d) is executed before the step (a), and the step (d) is executed before the step (b).

36. (Allowed) A 3-dimensional form data processing apparatus for producing a model, said processing apparatus comprising:

a first extracting portion for extracting a first classified characteristic area satisfying a first predetermined condition from a 2-dimensional image obtained by photographing an object,

a second extracting portion for extracting a second classified characteristic area satisfying a second predetermined condition from a distance image obtained by 3-dimensional measurement with respect to the object; and

a processing portion for carrying out data modification for modifying a part corresponding to the extracted first classified characteristic area and a part corresponding to the extracted second classified characteristic area with respect to a form model of the object obtained by the 3-dimensional measurement.

37. (Appealed) A 3-dimensional form data processing apparatus for producing a model, said processing apparatus comprising:

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an extracting portion for extracting characteristic area satisfying a predetermined condition from a 2-dimensional image obtained by photographing an object; and

a processing portion for carrying out data modification for modifying a part corresponding to the extracted characteristic area with respect to a form model of the object obtained by non-contact type 3-dimensional measurement for the object.

38. (Appealed) A 3-dimensional form data processing apparatus for producing a model said processing apparatus comprising:

an extracting portion for extracting an area satisfying a predetermined condition from a 2-dimensional image obtained by photographing an object; and

a processing portion for carrying out data modification for smoothing an undulation of a part corresponding to the extracted area with respect to a form model of the object obtained, by 3-dimensional measurement for the object.

39. (Appealed) A 3-dimensional form data processing apparatus comprising:

a generating portion for generating 3-dimensional form data of an object;

an extracting portion for extracting a part satisfying predetermined condition in the 3-dimensional form data; and

a processing portion for modifying the 3-dimensional form data in such a manner to provide the extracted part with an undulation like hair.

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